

Application No. 09/986,892

Amdt. Dated June 23, 2003

Reply to Office Action of March 24, 2003

## **REMARKS / ARGUMENTS**

Claim 1 and claims 3-7, 9-13 remain in the application. Claim 1 and claim 13 have been amended. Claims 2, 8 and 14 have been cancelled. Claims 15 and 16 have been added.

In the Office Action, the Examiner has taken the position that the subject matter of claims 1, 4-8, 10 and 12 is either anticipated by or obvious in view of WO 94/18939 to Carlin et al. The Examiner has also taken the position that the subject matter of claims 1-9 is obvious over Romano (U.S. patent No. 6,010,993), in view of Tapin (U.S. patent No. 4,952,398), Hungerbach et al. (U.S. patent No. 5,437,858) and Ando et al. (JP 04321628A). Finally, the Examiner has rejected claims 1-12 as being obvious over Carlin et al., in view of Tapin, Hungerbach et al., and Ando et al., and further in view of Lawless (The Illustrated Encyclopedia of Essential Oils) and Schnaubelt (Advanced Aromatherapy). The Examiner has also raised some technical objections to the specification and claims, pursuant to 35 U.S.C. 112.

In response to the Examiner's prior art rejections, we have amended claim 1 to better distinguish the claimed subject matter from the prior art. In particular, we have amended the preamble to restrict the claim to a composition for disinfecting or sanitizing surfaces, and we have amended clause (d) of claim 1 to include the limitation "wherein the ions enhance the antimicrobial properties of the at least one essential oil," and to add the limitation previously found in claim 2. In addition, we have amended claim 1 to include a new clause (e), which reads "wherein the composition is non-toxic and does not include any antimicrobially effective amounts of peroxygen bleach, hydrogen peroxide, glutaraldehyde or quaternary ammonium".

Support for these amendments can be found on page 4, lines 18-25 and in table 2 on page 8 of the specification. A review of table 2 on page 8 of the specification indicates that the subject compositions were successfully tested against *Staphylococcus aureus*, and that the addition of composition 9, containing 2.5% thyme oil, 0.5% lemongrass oil, 2.5% clove oil, 0.75% eucalyptus oil, 3.25% ethanol, and 0.1% BOD surfactant by volume, to *Staphylococcus aureus* cultures, resulted in a log reduction of 4.92. In the same assay, composition 10, which differs from composition 9 only in that 100 ppm of Blue Stone ions are added, produced a log reduction 6.3. These results indicate that the ion agent enhances the antimicrobial properties of the essential oils. These experimental results are unexpected, given the relatively small amount of agent ion used in composition 10, and could not have been predicted, in our submission.

In response to the Examiner's technical objections to the claims, we have amended claim 1 to replace the word "agent" with the term "ion agent", and we have amended claim 13 to make it dependent upon claim 12. We have also cancelled claim 8 and claim 14, as these claims are duplicates of claim 12 and claim 9, respectively.

Finally, we have added new dependent claims 15 and 16, to round out the claim coverage.

We submit that the above amendments overcome all of the rejections and objections raised by the Examiner, for the following reasons.

Regarding the claim rejections based upon the grounds that the claims are anticipated by or obvious in view of Carlin et al., we submit that Carlin et al. is in a different field of art, since it relates to an anti-plaque, anti-gingivitis oral hygiene composition. The composition disclosed by Carlin et al. is fundamentally different from the claimed composition, because the Carlin et al. composition utilizes an antimicrobial quaternary ammonium salt detergent, as one of its active ingredients, unlike the claimed composition. Furthermore, while Carlin et al. discloses the use of adding fluoride ion releasing fluorine compounds to his composition, these components do not fall within the claimed ion agent group consisting of copper sulfate cupric carbonate, and colloidal silver. In addition, the fluoride ions disclosed by Carlin et al. do not act in combination with the quaternary ammonium salt detergent to kill germs, but rather, the fluoride ions bind with tooth enamel and therefore prevent the formation of plaque which causes gingivitis. In contrast, the ion agent of the claimed invention acts to enhance the antimicrobial properties of the at least one essential oil. Thus the claimed ions are used for a purpose which is completely different from that of the Carlin fluoride ions. We therefore submit that the amendments to claim 1 clearly distinguish the claimed invention from Carlin et al.

Regarding the claim rejections based upon the grounds that the claims are obvious over Romano, in view of Tapin, Hungerbach et al. and Ando et al., we have added new clause (e) to claim 1, which specifies that the composition is non-toxic, and that the composition does not contain antimicrobial effective amounts of peroxygen bleach, hydrogen peroxide, glutaraldehyde, or quaternary ammonium.

Unlike the claimed invention, Romano discloses a specific formulation requiring four different antimicrobial compounds, including two toxic compounds, namely peroxygen bleach and glutaraldehyde, and Hungerbach and Ando et al. utilize hydrogen peroxide as the active ingredient. Peroxygen bleach and hydrogen peroxide are among the few well recognized active agents for disinfectants. There is no suggestion in these prior art references that their compositions would still function as disinfectants if one were to eliminate these active ingredients. In contrast, the claimed composition is non-toxic, and it specifically excludes active agents such as hydrogen peroxide and glutaraldehyde. Furthermore, there is no suggestion in Romano, Hungerbach or Ando et al. that the combination of an essential oil and an ion agent would function as an effective disinfectant in the absence of the active ingredients excluded by the claims.

We note that similar objections based upon Romano and Hungerbach were raised during the prosecution of the parent application, and that these objections were overcome by amending claim 1 to add the limitation "wherein the composition is non-toxic", after we conducted a telephone interview with Examiner Flood and Primary

Examiner Tait. Since the above amendment was sufficient to distinguish claim 1 of the parent application from Romano and Hungerbach, we submit that the present amendments, which exclude the toxic active ingredients of Romano and Hungerbach, are sufficient to clearly distinguish the claimed invention from Romano or Hungerbach.

We further submit that while some of the compositions of Hungerbach refer to 1% of peppermint oil, the peppermint oil is being used as a flavour agent in the context of the oral hygiene product of Hungerbach, as opposed to an active antimicrobial agent. Thus Hungerbach does not teach the use of essential oils as an active antimicrobial agent.

Regarding the obviousness rejection based in part on Tapin, we submit that Tapin requires the use of quaternary ammonium as its active ingredient, whereas claim 1 has been amended to exclude antimicrobial effective amounts of quaternary ammonium. Furthermore, there is no suggestion whatsoever in Tapin or any of the other prior art references that it might be possible to replace the quaternary ammonium active ingredient of Tapin with essential oils to create an antimicrobial composition like that of the subject invention, which is capable of disinfecting surfaces. While the Examiner notes on page 10 of the Examiner's Report that Tapin teaches that eucalyptus oil may be present in the Tapin composition, we note that the eucalyptus oil is used only as an antifoaming agent, and not as an agent which helps to kill germs. Thus there is no suggestion in Tapin that the use of the combination of copper sulfate and essential oils can result in a composition like that of the subject invention, which is capable of disinfecting or sanitizing surfaces, without using one of the prior art disinfecting agents excluded from the claims.

In summary, we submit that the combination of the prior art being replied upon by the Examiner does not teach that the combination of at least one essential oil and an ion agent from the specified group is sufficient, in the absence of one of the well-recognized disinfectants like hydrogen peroxide, to function as the active ingredients of a composition for disinfecting or sanitizing surfaces. Accordingly, it would not have been obvious to one skilled in the art, having knowledge of the other cited art, that the active disinfecting agents of Romano (peroxide bleach and gluteraldehyde) could be replaced with an ion agent selected from the group consisting of copper sulfate, cupric carbonate and colloidal silver, so as to create the composition defined in amended claim 1.

Regarding the claim rejection on the grounds that the claims recite subject matter which is obvious over Carlin et al. in view of Tapin, Hungerbach et al. and Ando et al., and further in view of Lawless and Schnaubelt, we submit that Carlin is in a different field of art, in that Carlin is an oral hygiene composition as opposed to a composition for disinfecting or sanitizing surfaces. Thus one skilled in the art of disinfectants for surfaces would not look to Carlin for inspiration, and even if he or she did, it would not be obvious for such person to combine the teachings of six different references in different fields of art as asserted by the Examiner. Furthermore, there is no suggestion in the cited references that the dental hygiene composition of Carlin would function as a disinfectant, if one were to eliminate its key active ingredient, i.e. the quaternary ammonium. Moreover, while Lawless refers to essential oils as having antimicrobial

properties, and Schnaubelt refers to essential oils as being effective in controlling the number of bacteria in air, these references do not teach that essential oils can be used as the major active ingredient of an effective disinfectant or sanitizer for surfaces. Thus this combination of references does not in fact teach that Carlin can be modified in the manner suggested by the Examiner to create the subject antimicrobial composition for disinfecting or sanitizing surfaces, as defined in the amended claims.

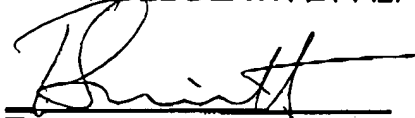
In view of the above considerations, we submit that amended claim 1 and the claims dependent thereon, define subject matter which is neither anticipated by nor obvious in view of the prior art.

In response to the objection to the specification, we have amended page 2, line 24, to indicate that BOD and Tween-80 are trade marks. We submit that this amendment properly notifies the readers of the existence of the subject trade marks, and that it is not necessary to capitalize each letter of a trade mark or to include a trade mark symbol.

Please charge any additional fees payable to our deposit account no. 02-2095.

We submit that this application is now in condition for allowance, and this action is respectfully requested.

Respectfully submitted,  
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